RFC 660
NIC 31202

Postel

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BBN-NET
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SOME CHANGES TO THE IMP AND THE IMP/HOST INTERFACE

In the next few weeks several changes will be made to the IMP software including changes to the IMP/Host software interface as specified in BBN Report No. 1822, Specifications for the Interconnection of a Host and an IMP. These changes come in four areas: a) decoupling of the message number sequences of Hosts; b) Host/Host access control; c) expansion of the message number window from four to eight; and d) provision for messages outside the normal message number mechanism. All changes are backward compatible with possible minor exceptions in timing.

a. Decoupling of the Host/Host message number sequences:
Since 1972 the IMP system has provided for exactly four messages to be outstanding at a time between any pair of IMPs, and thus, a total of only four messages between all the possible pairs of Hosts on the two IMPs. Because all the pairs of Hosts on the two IMPs have had to share the four outstanding messages, it has been quite possible for the various Hosts to interfere with each other. To remove this possibility of interference, the IMP's message number logic will soon be changed to allow a separate message number sequence between each pair of Hosts.

To keep manageable the space required to maintain the Host/Host message sequences above that presently are required for the IMP/IMP message sequences, the Host/Host sequences will be taken dynamically from a limited pool of possible sequences. The pool will be sufficiently large to seldom interfere with a pair of Hosts wishing to communicate. In no case will Hosts be prevented from communicating. In the event that the Hosts on an IMP desire to simultaneously communicate with so many other Hosts that the pool would be exhausted, the space in the pool is quickly multiplexed in time among all the desired Host/Host conversations so that none is stopped although all are possibly slowed.

b. Host/Host access control:
Upon instructions from ARPA, we will soon add a Host/Host access control mechanism to the IMPs. Any pair of Hosts wishing to communicate is checked (via bits in the IMP) to verify that they have administrative permission to communicate. This check normally is made whenever a pair of Hosts attempts to communicate after not having communicated for two minutes. If the pair of Hosts is not allowed to communicate, a special type of Destination Dead Message (sub-code 3) is returned to the source Host. The default case initially will be to allow all Hosts to communicate with each other.

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c. Message number window:
Once the message number sequences are on a Host/Host rather than IMP/IMP basis, the number of messages that will be permitted to be outstanding at a time between a pair of Hosts will be expanded from four to eight, permitting increased Host/Host throughput in some cases.

d. Message outside the normal mechanism:
For certain limited experiments which are being carried on using the network, it is thought to be desirable for specified Hosts to be able to communicate outside the normal ordered, error controlled message sequences. Thus, the following expansion to the IMP/Host protocol is being provided.

i. a single packet message coming from the source Host to the source IMP with a (new) special message type, 3, will be put directly into the IMP store-and-forward logic with a mark saying the packet is this special kind of message. A multi-packet message of type 3 will be discarded.

ii. such messages (packets) are routed normally to the destination IMP, possibly arriving out of order.

iii. at the destination IMP, messages of the special type will be put directly on the destination Host output queue skipping the reassembly logic and marked with a special (new) IMP to Host message type, also 3.

iv. there is no source-to-destination retransmission logic, no reassembly, no RFNMs, no incomplete transmissions, etc.

v. if at any time there are insufficient resources in the network to handle one of these special messages (e.g., the destination Host won't take it), the message will be discarded.

vi. by using the special message type between the Host and the IMP, the normal message number mechanism is preserved for all the Host/Host transmissions which presently depend on it.

Because the uncontrolled use of this mechanism will degrade the performance of the network for all users, the set of Hosts permitted to use this mechanism will be regulated by the Network Control Center.

Please file this note with your copy of BBN Report 1822 until that document is updated.

ADDRESS ASSIGNMENTS

Assigned Links

Contact:

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Documents:

Link Assignments:

Decimal	Octal	Use
0	0	Control Messages
1	1	Reserved
2-71	2-107	Regular Messages
72-152	110-230	Reserved
153	231	TIP Status Reporting
154	232	TIP Accounting
155-158	233-236	Internet Protocol
159-191	237-277	Measurements
192-195	300-303	Message Switching Protocol
196-255	304-255	Experimental Protocols

People:

Schedule:

Recent developments:

Assigned Sockets

Contact:

Jon Postel (POSTEL@SRI-ARC)

Documents:

Socket Assignments:

General Assignments:

Decimal	Octal	Use
0-63	0-77	Network Wide Standard Function
64-127	100-177	Hosts Specific Functions
128-223	200-337	Reserved for Future Use
224-255	340-377	Any Experimental Function

Specific Assignments

Decimal	Octal	Use
1	1	Old-Telnet
3	3	Old File Transfer
5	5	Remote Job Entry

7	7	Echo
9	11	Discard
11	13	Who is on or Systat
13	15	Date and Time
15	17	Who is up or Netstat
19	23	Character generator or Ttytst
21	25	New File Transfer
23	27	New Telnet
65	101	Speech Data Base at LL-TX-2
67	103	Datacomputer at CCA
69	105	CPYNET
71	107	NETRJS (EBCDIC) at UCLA-CCN
73	111	NETRJS (ASCII) at UCLA-CCN
75	113	NETRJS (TTY) at UCLA-CCN
77	115	any private RJE server
232-237	350-355	Authorized Mailer at BBN
239	357	Graphics
241	361	NCP Measurement
243	363	Survey Measurement
245	365	LINK
247	367	TIPSRV
249-255	371-377	RSEXEC

People:

Schedule:

Recent developments: